

PLANT AND PEST DIAGNOSTIC CENTER

The Plant and Pest Diagnostic Center is a diagnostic laboratory whose services are provided by the University of Tennessee Agricultural Extension Service. The center is located in Nashville, with six Extension specialists onsite at the facility. Other specialists are available in Knoxville and Jackson to assist in difficult diagnoses. Services include plant problem diagnosis, insect and weed identification, fescue endophyte testing and nematode analysis. Other tests are conducted on a seasonal basis, such as virus testing.

It is requested that all specimens be forwarded to the diagnostic laboratory through the local county Extension agent. Often an identification can be made at the local level, resulting in faster response to the grower. After a diagnosis is made, the form (minus the lab copy) will be returned to the county agent. The county agent can evaluate the laboratory diagnosis and make any changes or additions that are necessary before the grower copy is returned. All county Extension offices have a supply of mailing materials and appropriate specimen forms. Additional forms and mailing materials can be provided to the county offices by the Plant and Pest Diagnostic Center.

Distance Diagnostics Project

The Distance Diagnostics Project was designed to rapidly transmit images of pest problems and related information to the Plant Pest Diagnostic Laboratory located in Nashville, TN. The objective of this system is to improve the diagnostic response time, therefore improving crop sustainability while promoting best management and integrated pest management practices for clientele in Tennessee. This project enhancement was initiated due to the nature of insects, plant diseases and weeds which have the ability to rapidly multiply and where immediate control is essential in order to reduce economic losses. Distance Diagnostics enhances the Plant Pest Diagnostic Center's system in which samples are sent via mail. By using web based imaging and informational test format, specimens can be rapidly diagnosed. This system will also provide a pest imaging library which can be used for research and teaching.

General Responsibilities for Everyone Using the Distance Diagnostics System:

Submitting Images - Specimen images submitted using this system will be accepted only when received through county Extension offices and other designated distance diagnostic locations such as Jackson, Nashville and Knoxville. Also, by sending images through the local Extension office, county personnel will become more familiar with county clientele and specific pest problems which occur in the county. In addition, uploading images and forms only from selected points will help reduce possible virus infection of the system.

The Entomology and Plant Pathology Department will train county personnel on the diagnostic characteristics that are important in identification of arthropod and disease pests. The Plant and Soil Science Department will inform Extension personnel of proper photographic procedures for weed identification and in cases where herbicide injury is suspected.

Uploading Images

For security purposes and management of uploaded images, only upload images in the “JPG” format. JPG images are compressed and generally take less time to upload than most other graphic formats. Contact Darrell Hensley (865-974-7958) or Dr. Alan Windham (615-832-6802) for further information regarding this project.

COLLECTING AND PREPARING SPECIMENS FOR MAILING:

1. Fill out the appropriate form as completely as possible. On the back of each form are directions for collecting the kind of sample that is needed for diagnosis.
2. Send generous amounts of material; wrap plant material in dry paper and enclose plant material in plastic bags; never add water to any sample. Never mix several host species or different problems in a single bag; do not have any loose soil in the bag with plant material. **Never put the specimen form in the same bag as the plant material or soil.**
3. Send specimens immediately after collecting. If holdover periods are encountered, refrigerate the specimen. Mail packages to arrive on weekdays rather than during the weekend.
4. Protect specimens from being crushed in the mail. Place insects in a vial with alcohol or insect preservative and send in a mailing tube. Collect at least two or three insect specimens from the same location. Do not place moths, butterflies or any adult insect with wings in alcohol. Place them in a killing jar and then transfer them to a small crushproof container for mailing. Mites, thrips and scale insects should be sent on the host plant material, packaged as you would diseased plants. If possible, small caterpillars, grubs and maggots should be sent live in a plastic bag with some of the host material.
5. **If a general decline or dying of plants is observed**, send whole plants showing early symptoms, with roots and adjacent soil intact. Dig plants up carefully - do not pull up. If a field crop, send several plants. Tie a plastic bag around the roots and soil to keep soil from deteriorating the foliage. If it is not possible to send whole plants, send a generous sample of above-ground portions showing early symptoms. For die-back and general decline, the lower stem and roots with attached soil are the most useful part of the plant. If it is not possible to send the lower stem, send at least a pint of soil and a good handful of small feeder roots. Do not allow the roots to dry out.
6. When **localized infections** such as cankers, leaf spots and rots are involved, send specimens representing early and moderate stages of the disease. Include healthy portions of the tissue from above and below the diseased area. Fleshy specimens should have a **DRY** paper towel in the plastic bag with the specimen, especially in hot weather. This will absorb any excess moisture. In hot weather, punch several holes in the plastic bag for ventilation. Fleshy fruit and vegetables should be wrapped separately. Paper towels are better wrappings, but brown paper and newspaper are good. Keep all specimens cool.

7. Soil collected for **nematode analysis** should be placed in a plastic bag and tied to keep from drying out. Special bags are available. Do not allow this soil to get hot, as this will affect the results of the nematode analysis. About a pint of soil is needed for the basic nematode test and about a half gallon of soil is needed for the soybean cyst nematode race determination test. See the back of Form 736 for sampling methods.
8. **Weed specimens** for identification should be complete plants which have leaves, stem, roots and either flowers or fruit. Wrap the roots and stem of the plant in a moist (not soaking wet) paper towel, then wrap loosely in a plastic bag and put in a box or padded envelope adequate to prevent crushing. Blot excess moisture from aquatic plants and wrap as above.

HANDLING FEES FOR SAMPLES:

1. **Nematode Samples:**
 - A. Basic soil sample - \$5 each (\$15 out-of-state). Nematodes will be extracted from the soil and/or root tissues and the populations of plant parasitic types will be determined to genus. Requires 1-2 weeks.
 - B. Soybean Cyst Nematode Race Determination - \$15 each (\$25 out-of-state). A determination of the race(s) of soybean cyst nematodes present in a soil sample will be determined by growing differential soybean varieties in soil samples in the greenhouse. Requires 60-80 days.
2. **Fescue Endophyte Samples:**
 - A. Tissue staining test - \$15 each (\$25 out-of-state). Tissue from a specified number of tillers will be stained and observed for the presence of the fungus endophyte. A percent of tillers infected will be determined. Requires 2-3 weeks.
 - B. Seed staining test - \$15 each (\$25 out-of-state). Freshly harvested seed will be stained and observed for the presence of the fungus endophyte. A percent of infected seed will be determined. Requires 2-3 weeks.
 - C. Seed grow-out test - \$20 each (\$30 out-of-state). Seed that is one year old or older will be planted in the greenhouse. Tissue from developing seedlings will be stained and observed for the presence of the fungus endophyte. A percent infection will be determined. Requires 14-16 weeks.
3. **Weeds, Diseases and Insect Samples:**
 - A. Diagnosis or Identification - Samples submitted by Extension staff. No charge.
 - B. Diagnosis or Identification - Samples submitted by persons other than Extension staff. Simple visual identification (including microscopic identification). No charge.
 - C. Diagnosis or Identification - Plant and pest samples requiring incubation, rearing, isolation, culturing, virus tests, serological tests, host inoculation, extensive keying for identification and/or other recognized laboratory and greenhouse procedures. Requires 1-3 weeks. \$10 each (\$20 out-of-state). Notice of charge will be given in advance of testing.
 - D. Contractual Agreement - Special arrangements will be required for individuals, consultants or commercial organizations requesting disease diagnoses or pest identification on large numbers of samples. Charge to be determined in advance.

MAKE ALL CHECKS PAYABLE TO:

THE UNIVERSITY OF TENNESSEE

SHIPPING INFORMATION:

All specimens should be mailed to:

**UT Plant & Pest Diagnostic Center
5201 Marchant Drive
Nashville, TN 37211-5112**

Samples shipped other than by the U.S. Postal Service (via UPS or Federal Express) should be sent to a different zip code address: 5201 Marchant Drive, Nashville, TN 37220.

The Plant and Pest Diagnostic Center may be reached for questions about sampling or test results at (615) 832-6802 or by e-mail at tcstebbins@ext1.ag.utk.edu

Requests are often received for services that are not available at the Plant and Pest Diagnostic Center. Aflatoxin & Nitrate testing is available through:

**C. E. Kord Animal Diagnostic Laboratory
P.O. Box 40627, Melrose Station
Nashville, TN 37204
(615) 837-5125**

This testing service is available to Tennessee grower's at no charge.

The Agricultural Extension Service offers its programs to all eligible persons regardless of race, color, age, national origin, sex, veteran status, religion or disability and is an Equal Opportunity Employer.

COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS

The University of Tennessee Institute of Agriculture, U.S. Department of Agriculture,
and county governments cooperating in furtherance of Acts of May 8 and June 30, 1914.

Agricultural Extension Service Charles L. Norman, Dean

